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Pickled Products from Green Mussel

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Methods of preparing different types of delicious ready to serve pickled products from green mussel *(Perna viridis)* and a comparative study of their storage characteristics are reported. Of the three types of products, namely, dried and pickled, fried and pickled and light smoked and pickled, the last one had the best shelf life. The optimum conditions of drying and smoking for preparing such type of pickles are also reported.

Sizeable quantities of green mussel *(Perna viridis)* are landed along the Malabar coast, especially from Calicut to north. Presently it is fetching only a very poor return to the fishermen, as it is consumed by the local population only. Very few attempts have been made to utilize them properly. Methods have been worked out at the Central Institute of Fisheries Technology for producing attractive canned and cured products from green mussels (Balachandran & Nair, 1975; Muraleedharan *et al.*, 1979). Production of ready to serve pickled products from mussels appears to be the best method for its economic utilisation. Such a product will have a very good internal market as a table delicacy which in turn fetch better return to the fishermen. Different pickled products, were thus prepared and their storage life are reported.

Materials and Methods

Green mussels, collected from the rocky Korapuzha estuary, about 10 km from Calicut, were brought to the laboratory in live condition and washed well in running water. They were then placed in sand free water for a day, transferred to fresh chlorinated water (5 p.p.m. available chlorine) for 2 h which resulted in the complete expulsion of sand from the stomach of mussels. The meat was then shucked alive and analysed for moisture, fat, protein, ash, acid insolubles, calcium and phosphorus by the methods of AOAC (1960) and glycogen was estimated by the method of Van de Kleiy (1951). The shucked meat was blanched in 5% brine for 5 min (750 ml brine for kilogram of meat) and pickled in three lots as follows.

1. *Dried and pickled mussels*

The mussel meat was dried over clean rust free wire trays in sun to a moisture level of 40%. 500 g dried meat was then heated with gingelly oil to light brown colour. This meat was pickled using condiments as given below.

Partially dried, oil heated meat	500 g
Green chillies (sliced)	25 g
Fresh ginger (sliced)	50 g
Crushed garlic	25 g
Chilly powder	50 g
Turmeric powder	5 g
Refined salt	25 g
Skinned mustard	25 g

The blended condiments were gently heated in gingelly oil and transferred to partially dried meat, mixed well in a dry container, 100 ml of vinegar added and the container closed air tight after pouring some oil over the top layer.

2. *Fried and pickled mussels*

The blanched meat (moisture 60%) was directly fried in gingelly oil (without any pre-drying) until light brown in colour, pickled and stored in containers as described above.

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3. *Smoked and pickled mussels*

Another portion of the blanched meat was partially sun dried to 50% moisture and smoked in vertical smoke kiln at 85–90° C for 30 min and moisture brought down to a level of 35%. The light smoked meat was then pickled and kept in air tight dry containers as in the earlier cases but only 50 ml vinegar was used. The products were periodically analysed for shelf life.

Results and Discussion

Table 1 gives the proximate composition of fresh mussel meat. Keeping the live mussels in water for a day followed by 2 h in chlorinated water facilitated to remove the sand from the stomach. Manual removal of sand from stomach was time consuming which also resulted in distortion of meat.

The recipe employed can be suitably altered to suit individual taste. Of the various oils, coconut oil gave a good product, but it turned rancid easily. Mustard oil prevented mould growth effectively. But mustard oil taste may not be very much relished and hence gingelly oil was preferred. Use of skinned mustards along with gingelly oil was found sufficient to protect the pickle from mould growth without affecting the taste and flavour. For those who relish mustard oil, mustard oil can be used.

In the dried and pickled product the

Table 1. *Proximate composition of mussel meat*

Moisture %	82.950
Protein %	8.940
Fat %	1.950
Ash %	1.620
Calcium %	0.852
Phosphorus %	0.325
Acid insolubles %	0.058
Glycogen %	3.910

Table 2. *Storage characteristics of mussel pickles*

Storage period Days	Fried and pickled	Dried and pickled	Smoked and pickled
30	Good	Good	Good
60	Good	Good	Good
90	Good	Good	Slight smoky flavour
120	Meat softened, acceptable	Meat slightly softened, acceptable	Very slight smoky flavour, acceptable
150	Meat softened, slight off odour, acceptable	Meat softened, slight off odour, acceptable	Very slight, smoky flavour, acceptable
180	Meat comes off easily, stray patches of fungus on top layer, acceptable	Meat comes off easily, fungus on top layer, off odour, not acceptable	Smoky flavour decreased, stray patches of fungus on top layer, acceptable
200	Intense off odour, meat darkened, fungus present, not acceptable	Spoiled	Smoky flavour further decreased, slight off odour, stray patches of fungus, acceptable

drying should be stopped at 40% moisture. Excessive drying will impart hard texture and take more time to mature the pickle. In smoked and pickled products partial drying was essential for uniform and proper uptake of smoke. Excessive drying and smoking are to be avoided. Smoking for 30 min is found sufficient to impart an appealing flavour.

The storage characteristics of the products are presented in Table 2. The fried and pickled product was found to "mature" within 2 days in the pickle whereas the dried and pickled product took 3 days and the smoked and pickled one took 4 days to mature. All the products could be stored till 6 months. Comparatively, the smoked and pickled product had a slightly better shelf life and was acceptable even after 200 days of storage, though the smoky flavour was found to be reduced. The dried and pickled one softened and disintegrated by then. Stray patches of fungus were also observed on the top layer. Similar characteristics were also noticed in the fried and pickled product after six months.

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